

Appln No. 09/700,572

Amdt date May 10, 2004

Reply to Office action of January 8, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for automated detection and checking of geometrical and/or textural features of an object in various views comprising side views and a plan view, using an opto-electronic image-recording device ~~as well as~~ and a storage and evaluation unit for image processing and image evaluation, wherein quality or state assessment of the object is effected by a comparison with parameters which are predetermined in respect of the individual features, ~~wherein~~ the method comprising:

substantially simultaneously recording a plurality of partial images of the object ~~are substantially simultaneously recorded~~ by means of a number of image-recording devices and beam-deflection means, which number is smaller than the ~~plurality~~ number of partial images, [[and]]

optically assembling at least a portion of the partial images ~~at least partially optically assembled~~ at the same time to form an overall image which shows all views and in which [[the]] boundaries of the partial images can be recognised, and the overall image is evaluated separately for checking [[the]] individual features in the boundaries of the partial images, ~~characterised in that~~

[[-]] in the regions of the overall image, which show side views on to the object, ascertaining locations at which the

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object comes very close to a support surface ~~are ascertained~~ by analysis of ~~[[the]]~~ gray value distributions,

~~[[-]]~~ subsequently detecting the light quantity which passes through between the object and the support surface and which is reflected in ~~[[the]]~~ pixels as an intensity value ~~is detected~~,

~~[[-]]~~ determining, using the intensity values, the local light quantity pattern characterising the width of a gap between the object and the support surface ~~is determined using the intensity values,~~ and

~~[[-]]~~ converting the light quantity pattern ~~is converted~~ in accordance with a predetermined algorithm using calibration information into a gap width which is present between the object and the support surface.

2. (Currently Amended) A method as set forth in claim 1 ~~characterised in that all~~ wherein the partial images are assembled optically and recorded by ~~precisely~~ one image-recording device.

3. (Currently Amended) A method as set forth in claim 1 or claim 2 ~~characterised in that~~ wherein in the overall image ~~[[the]]~~ regions of the partial images are ~~[[so]]~~ positioned and identified, using the storage and evaluation unit, so that they can be associated with ~~[[the]]~~ individual views.

4. (Currently Amended) A method as set forth in claim 1 ~~characterised in that~~ wherein in at least one additional step ~~[[the]]~~ a scene is recorded without the object and/or with a reference object which has predetermined parameters in respect

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of the features and the ~~corresponding~~ overall image is ~~[[put]]~~ stored in the storage and evaluation unit for comparison and calibration ~~purposes~~.

5. (Currently Amended) A method as set forth in claim 1 ~~characterised in that~~ wherein in a region of the overall image comprising a plan view, by means of image processing, using convolution filters, areas with severe local intensity differences are emphasised, detected and quantified in respect of their dimensions.

6. (Currently Amended) A method as set forth in claim 1 ~~characterised in that~~ wherein integrated into the overall image is a representation of the side of the object which is remote from the image-recording device or devices.

7. (Currently Amended) An apparatus for automated detection and checking of geometrical and/or textural features of an object in various views comprising side views and a plan view, comprising:

an opto-electronic image-recording device and a storage and evaluation unit for image processing and image evaluation, ~~wherein there are provided and~~ and

optical means for beam deflection, ~~by means of which~~ wherein a plurality of partial images of the object are substantially simultaneously recorded by a number of image-recording devices, which number is smaller than the ~~plurality~~ number of partial images, and wherein the partial images are at least partially assembled optically at the same time to form an

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overall image which shows all views and in which ~~[[the]]~~ boundaries of the partial images are recognisable, ~~[[wherein]]~~

lens arrangement means associated with at least one of the beam-deflection means ~~are lens arrangement means~~ for changing ~~[[the]]~~ an imaging scale of at least one partial image with respect to at least one other partial image, and ~~characterised in that there is provided~~

a flat support surface for the object, wherein ~~[[and]]~~ the beam-deflection means are arranged substantially in the plane of the support surface ~~in such a way that there is~~ to provide a view parallel to the support surface, ~~which permits~~ and to permit checking of ~~[[the]]~~ coplanarity of a plurality of parts of the object, which are towards the support surface.

8. (Currently Amended) An apparatus as set forth in claim 7 ~~characterised in that there is provided~~ comprising a single image-recording device, relative to which the object is positioned ~~in such a way that it fills~~ to fill only a partial region of ~~[[its]]~~ a field of view of the image-recording device ~~which is determined by [[the]] a viewing angle, and that wherein~~ disposed in remaining parts of the field of view are beam-deflection devices which project side views of the object on to the image-recording device.

9. (Currently Amended) An apparatus as set forth in claim 7 or claim 8 ~~characterised in that~~ wherein the beam-deflection means comprises either displaceable prisms or mirrors or prisms or mirrors comprising curved surfaces.

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10. (Currently Amended) An apparatus as set forth in claim 7 or claim 8 ~~characterised in that~~ wherein the beam-deflection ~~beams have~~ means comprise a light guide device.

11. (Canceled)

12. (Currently Amended) An apparatus as set forth in claim 7 ~~characterised by~~ comprising a lighting device comprising a light diffuser device for producing a uniform light flux under the object, which is arranged behind projecting parts of the object.

13. (Currently Amended) An apparatus as set forth in claim 12 ~~characterised in that~~ wherein the light diffuser device is interrupted ~~in such a way as~~ to permit a view on to the side of the object, which is remote from the ~~or all~~ image-recording device or devices.

14. (Currently Amended) An apparatus as set forth in claim 7 ~~characterised in that~~ wherein the image-recording device and the storage and evaluation unit are integrated to form a structural unit.

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Amendments to the Drawings:

The attached sheet of drawings includes a new sheet 5 which includes new Figure 6.

Attachment: New Sheet 5